Title: LONG-TERM SEAGRASS MONITORING IN THE FKNMS.

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Project Summary: This proposal describes the continuation of the long-term monitoring of seagrass beds in the Florida Keys National Marine Sanctuary (FKNMS). This program is funded by an EPA-NOAA/COP partnership; since 2002 EPA's Water Quality Protection Program and NOAA's South Florida Program have shared funding this program. The program was designed to address the following objectives: 1) Define the present distribution of benthic communities within the FKNMS, 2) Provide high-quality, quantitative data on the status of the seagrasses within the FKNMS, 3) Quantify the importance of seagrass primary production in the FKNMS, 4) Define the baseline conditions for the seagrass communities, 5) Determine relationships between water quality and benthic community status, and 6) Detect trends in the distribution and status of the benthic communities.

In this project, two sampling strategies are used: 1) semi-synoptic maps of indicator parameters are generated through sampling ca., 350 randomly-located points in a 19,000 km2 area that includes the FKNMS and the region of shallow coastal water to the north of the sanctuary, south of Cape Romano, and west of Everglades National Park; and 2) quarterly sampling of fixed transects at 30 permanent monitoring sites in the FKNMS. Indicators of the status of the seagrass communities assessed include: species composition, cover and abundance of macrophyte communities, elemental content of seagrass leaves, stable isotopic composition of seagrass leaves, seagrass physiological status as measured by PAM fluorometry seagrass morphology, and seagrass growth rate. The reasons for the selection of these indicators are given in the proposal.

At the permanent sites, quarterly measures of these indicators have been made since winter of 1995. Four permanent stations have shown persistent, long-term changes consistent with our models of ecosystem eutrophication. The slow rates of change indicate the need for monitoring for long periods to be able to detect net change; the fact that storms have affected 1-% of these randomly selected locations indicates

	that all stations are needed in order to assure long-term records in the absence of storm-induced disturbance. Synoptic mapping was carried out during the years 1996-2000. In 2003, the 300 stations originally surveyed in 1996 were revisited; in 2004 the stations visited in 1997 will be revisited, etc. This will allow for over 1000 pairwise measurements of the magnitude and direction of change in seagrass communities that are likely to be the first affected by human activity. Lastly, statistical models describing the relationships between seagrass habitat status and water quality will be further developed in conjunction with the water quality monitoring program for the FKNMS.
Relevance to Restoration and/or Resource Management:	As defined by the FKNMS management plan, the general objectives of seagrass monitoring in the FKNMS are to measure the status and trends of seagrass communities to evaluate progress toward protecting and restoring the living marine resources of the sanctuary and to provide data needed to make unbiased, statistically rigorous statements about the status and temporal trends of seagrass communities. Monitoring data generated from this program will also be used to assess impacts of activities associated with the Comprehensive Everglades Restoration Plan (CERP) (see CERP's Monitoring and Assessment Plan at http://www.evergladesplan.org/pm/recover/recover_map_2004.cfm).
Geographic Area:	Florida Keys National Marine Sanctuary.